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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/806,198

03/23/2004

York Alexander Beste

54391

2001

26474 7590 03/22/2007  
NOVAK DRUCE DELUCA & QUIGG, LLP  
1300 EYE STREET NW  
SUITE 1000 WEST TOWER  
WASHINGTON, DC 20005

EXAMINER

THERKORN, ERNEST G

ART UNIT

PAPER NUMBER

1723

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/22/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/806,198

Applicant(s)

BESTE ET AL.

Examiner

Ernest G. Therkorn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-13,15,17,18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-13,15,17,18 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

Claims 18 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. No support can be found for "firstly providing the contaminated ionic liquid .... non-polar organic solvent, subsequently". As such, the claims are considered to be drawn to new matter.

Claims 1-4, 6-13, 15, 17, 18, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The metes and bounds of "high-boiling compounds" and "which cannot be removed completely from the ionic liquids" can not be determined. As such, the claims are considered to be indefinite.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 8-11, 13, 15, 17, 18, and 20 are rejected under 35 U.S.C. 102(B) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Earle (U.S. Patent Publication No. 2004/0015009). The claims are considered to read on Earle (U.S. Patent Publication No. 2004/0015009). However, if a difference exists between the claims and Earle (U.S. Patent Publication No. 2004/0015009), it would reside in optimizing the elements of Earle (U.S. Patent Publication No. 2004/0015009). It would have been obvious to optimize the elements of Earle (U.S. Patent Publication No. 2004/0015009) to enhance separation.

Claims 1-3, 8-11, 13, 15, 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291). At best, the claims differ from Earle (U.S. Patent Publication No. 2004/0015009) in the clarity that nitrotoluene is a polar high boiling compound. Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 discloses that nitrotoluene boils at 218 degrees Celsius. This is considered to be high boiling. Kawaki (U.S. Patent No. 5,543,474) on column 12, lines 8-10 discloses that nitrotoluene is polar. Thiem (U.S. Patent No. 4,751,291) on column 2, lines 36-41 discloses that

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nitrotoluene is polar. It would have been obvious that Earle (U.S. Patent Publication No. 2004/0015009)'s nitrotoluene is a polar high boiling compound because Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 discloses that nitrotoluene boils at 218 degrees Celsius and either because Kawaki (U.S. Patent No. 5,543,474) on column 12, lines 8-10 discloses that nitrotoluene is polar or because Thiem (U.S. Patent No. 4,751,291) on column 2, lines 36-41 discloses that nitrotoluene is polar.

Claims 2, 7, 9, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) as applied to claims 1-3, 8-11, 13, 15, 17, 18, and 20 above, and further in view of Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411. At best, the claims differ from Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) in reciting use of ion exchange chromatography. Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 discloses on pages 410-411 that ion exchange was the first of the various liquid chromatography methods to be used widely under modern liquid chromatography conditions. It would have been obvious to use ion exchange chromatography in Earle (U.S. Patent Publication No. 2004/0015009)

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alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) as his particular type of chromatography because Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 discloses on pages 410-411 that ion exchange was the first of the various liquid chromatography methods to be used widely under modern liquid chromatography conditions.

Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461, either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291), and Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 as applied to claims 2, 7, 9, 18, and 20 above, and further in view of Mikes' Laboratory Handbook of Chromatographic and Allied Methods, John Wiley & Sons New York, 1979, pages 218-219. At best, the claims differ from Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461, either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291), and Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 in the clarity of reciting a resin. Mikes' Laboratory Handbook of Chromatographic and Allied Methods, John Wiley & Sons New York, 1979, pages 218-219 discloses that synthetic resins are of the greatest importance for ion exchange

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chromatography. It would have been obvious that Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461, either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291), and Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 uses a resin because Mikes' Laboratory Handbook of Chromatographic and Allied Methods, John Wiley & Sons New York, 1979, pages 218-219 discloses that synthetic resins are of the greatest importance for ion exchange chromatography.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) as applied to claims 1-3, 8-11, 13, 15, 17, 18, and 20 above, and further in view of Gerhold (U.S. Patent No. 4,402,832). At best, the claim differs from Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) in reciting use of a continuous chromatography process. Gerhold (U.S. Patent No. 4,402,832) (column 1, lines 29-39) discloses that use of a simulated moving bed is a very successful process for separating components from a feed mixture. It would have been obvious to use a continuous chromatography process in Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either

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Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) because Gerhold (U.S. Patent No. 4,402,832) (column 1, lines 29-39) discloses that use of a simulated moving bed is a very successful process for separating components from a feed mixture.

Claims 6, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) as applied to claims 1-3, 8-11, 13, 15, 17, 18, and 20 above, and further in view of Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411. At best, the claims differ from Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) in reciting use of water as a solvent and reversed phase silica gel. Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 on pages 270-272 and 285 discloses that reversed phase silica gel packings are the closest to a universal system for modern liquid chromatography and that water is usually used as a base solvent. It would have been obvious to use water as a solvent and reversed phase silica gel in Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291)



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because Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 on pages 270-272 and 285 discloses that reversed phase silica gel packings are the closest to a universal system for modern liquid chromatography and that water is usually used as a base solvent.

Claims 11, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) as applied to claims 1-3, 8-11, 13, 15, 17, 18, and 20 above, and further in view of Wasserscheid (Ionic Liquids in Synthesis). At best, the claims differ from Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) in reciting evaporating low boiling compounds. Wasserscheid (Ionic Liquids in Synthesis) discloses on page 17, lines 13-15 discloses that any volatile compound may be removed from an ionic liquid by distillation. It would have been obvious to evaporate low boiling compounds in Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291) because Wasserscheid (Ionic Liquids in Synthesis) discloses on page 17, lines 13-15 discloses that any volatile compound may be removed from an ionic liquid by distillation.

Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291), and Wasserscheid (Ionic Liquids in Synthesis) as applied to claims 11, 18, and 20 above, and further in view of Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 and Mikes' Laboratory Handbook of Chromatographic and Allied Methods, John Wiley & Sons New York, 1979, pages 218-219. At best, the claims differ from Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291), and Wasserscheid (Ionic Liquids in Synthesis) in reciting use of a resin. Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 discloses on pages 410-411 that ion exchange was the first of the various liquid chromatography methods to be used widely under modern liquid chromatography conditions. Mikes' Laboratory Handbook of Chromatographic and Allied Methods, John Wiley & Sons New York, 1979, pages 218-219 discloses that synthetic resins are of the greatest importance for ion exchange chromatography. It would have been obvious that Earle (U.S. Patent Publication No. 2004/0015009) alone or further in view of Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 and either Kawaki (U.S. Patent No. 5,543,474) or Thiem (U.S. Patent No. 4,751,291), and Wasserscheid

(Ionic Liquids in Synthesis) uses a resin because Snyder, Introduction to Modern Liquid Chromatography, John Wiley & Sons New York, 1979, pages 270-272, 285, and 410-411 discloses on pages 410-411 that ion exchange was the first of the various liquid chromatography methods to be used widely under modern liquid chromatography conditions and Mikes' Laboratory Handbook of Chromatographic and Allied Methods, John Wiley & Sons New York, 1979, pages 218-219 discloses that synthetic resins are of the greatest importance for ion exchange chromatography.

The remarks urge that page 11 of the specification makes the terms "low boiling point" and "high boiling point" definite. However, page 11 of the specification does not indicate what temperature range would be considered to be "low boiling point liquids" and what temperature range would be considered to be "high boiling point liquids." As such, page 11 of the specification does not contribute to making the terms "low boiling point" and "high boiling point" definite.

The remarks urge that separation of a polar, high boiling compound is not shown. However, Earle (U.S. Patent Publication No. 2004/0015009) discloses the separation of nitrotoluene in paragraph 24, line 9; paragraph 26, line 9; and paragraph 28, line 9 from ionic liquid (paragraphs 42-43). Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 discloses that nitrotoluene boils at 218 degrees Celsius. This is considered to be high boiling. Kawaki (U.S. Patent No. 5,543,474) on column 12, lines 8-10 discloses that nitrotoluene is polar. Thiem (U.S. Patent No. 4,751,291) on column 2, lines 36-41 discloses that nitrotoluene is polar. It would have been obvious that Earle (U.S. Patent Publication No. 2004/0015009)'s nitrotoluene is a polar high boiling

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compound because Hackh's Chemical Dictionary, McGraw-Hill Book, New York, 1972, page 461 discloses that nitrotoluene boils at 218 degrees Celsius and either because Kawaki (U.S. Patent No. 5,543,474) on column 12, lines 8-10 discloses that nitrotoluene is polar or because Thiem (U.S. Patent No. 4,751,291) on column 2, lines 36-41 discloses that nitrotoluene is polar.

The remarks urge that Earle (U.S. Patent Publication No. 2004/0015009) is directed to separation by distillation and not adsorption. However, Earle (U.S. Patent Publication No. 2004/0015009) on paragraph 8 discloses that distillation and chromatography are interchangeable separation means. As such, Earle (U.S. Patent Publication No. 2004/0015009) is considered to disclose adsorption.

The remarks urge patentability based upon the phrase "which cannot be removed completely from the ionic liquids". However, it is not clear what degree of separation is intended by the applicants to have complete separation.

Any inquiry concerning this communication should be directed to E. Therkorn at telephone number (571) 272-1149. The official fax number is 571-273-8300.

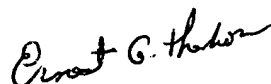
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**Ernest G. Therkorn**  
**Primary Examiner**  
**Art Unit 1723**

EGT

March 19, 2007